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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte AHMAD WALEH
and ERIC O. LEVENSON

Appeal 2009-013067
Application 10/786,280
Technology Center 1700

Before ADRIENE LEPIANE HANLON, MARK NAGUMO, and
MICHAEL P. COLAIANNI, *Administrative Patent Judges*.

COLAIANNI, *Administrative Patent Judge*.

DECISION ON APPEAL¹

¹ The two-month time period for filing an appeal or commencing a civil action, as recited in 37 C.F.R. § 1.304, or for filing a request for rehearing, as recited in 37 C.F.R. § 41.52, begins to run from the “MAIL DATE” (paper delivery mode) or the “NOTIFICATION DATE” (electronic delivery mode) shown on the PTOL-90A cover letter attached to this decision.

This is a decision on an appeal under 35 U.S.C. § 134 from the Examiner's final rejection of claims 1 through 4, 6, 7, 11 through 14, 18 through 25, 29, and 30. Claims 5, 8 through 10, 15 through 17, and 26 through 28, the other claims pending in this application, stand withdrawn from consideration by the Examiner. We have jurisdiction pursuant to 35 U.S.C. § 6.

We REVERSE.

STATEMENT OF THE CASE

The subject matter on appeal is directed to an improved method of partially or completely removing organic coatings, films, layers or residues from a substrate. The standard method (representative claim 1 is written in Jepson format) involves (1) exposing the substrate to sulfur trioxide gas and then (2) rinsing the substrate with a solvent. The critical improvements, for purposes of this appeal, are the following additional steps:

(b) subjecting said substrate of step (a) to a precursor chemical or physical treatment prior to step (1) capable of facilitating said reaction of said sulfur trioxide with said organic material to be removed;

* * *

(f) subjecting said substrate to a chemical or physical post-rinse treatment subsequent to step (2) capable of removing any residual organic matter from said substrates remaining after said solvent rinse.

The Examiner maintains the rejection of claims 1-4, 6, 7, 11-14, 18-25 and 29-30 under 35 U.S.C. § 103(a) over Gupta (US 5,037,506, issued Aug. 6, 1991) in view of Mayer (US 3,893,869, issued Jul. 8, 1975) and further in view of Nachshon (US 5,114,834, issued May 19, 1992); the Engelsberg article (*Laser-Assisted Cleaning Proves Promising*, CLEANING

ALTERNATIVES, May 1995); Engelsberg ‘472 (US 5,643,472, issued Jul. 1, 1997); Engelsberg ‘857 (US 5,531,857, issued Jul. 2, 1996); Engelsberg ‘968 (US 5,024,968, issued Jun. 18, 1991); Livshits (WO 97/17164, published May 15, 1997); and Elliott (WO 95/07152, published Mar. 16, 1995).

ISSUE

Did the Examiner’s § 103 rejection over the applied prior art references satisfy the Examiner’s initial burden of presenting a prima facie case of obviousness so as to shift the burden to Appellants to establish non-obviousness of the claimed invention? We decide this issue in the negative.

FINDINGS OF FACT (FF)

1. The Specification discloses that the rinse solvent may be “water, a lower alkanol (1 to 5 carbon atoms), acetone, or mixtures thereof, various acidic or alkaline solutions or amine-based solutions.” (Spec. ¶ [0067]).
2. The Specification discloses that “[p]recursor physical or chemical treatments include . . . ultra-violet light radiation (UV).” (Spec. ¶ [0059]).
3. The Specification discloses that “[p]re-rinse physical or chemical treatments include . . . sound energy such as megasonic or ultrasonic treatments.” (Spec. ¶ [0066]).
4. The Specification discloses that “[p]ost-rinse physical or chemical treatments include . . . laser energy.” (Spec. ¶ [0068]).

5. Gupta teaches stripping a polymerized photoresist via, *inter alia*, exposing the polymerized photoresist to gaseous sulfur trioxide and rinsing in a solution to remove any reaction products. (Gupta, col. 4, ll. 15-57 and col. 1, ll. 5-17 and col. 2, ll. 31-50). In this regard, Gupta teaches that “sulfur trioxide vapor for 45 seconds followed by rinsing with water resulted in complete removal of the organic coatings (photoresists) from the exposed surfaces.” (Gupta, col. 5, l. 67 to col. 6, l. 2).
6. Gupta does not disclose a chemical or physical post-rinse treatment as recited in the claims on appeal.
7. Nachshon teaches the complete stripping of a photoresist layer using, *inter alia*, a reactive atmosphere before irradiation via pulsed laser. (Nachshon, col. 2, l. 33 to col. 3, l. 60).
8. The Engelsberg article, Engelsberg ‘472, Engelsberg ‘857, Engelsberg ‘968, Elliott, and Livshits, individually teach the removal of material or contaminants using, *inter alia*, a laser. (The Engelsberg article, p. 157; Engelsberg ‘472, col. 3, l. 60 to col. 4, l. 30; Engelsberg ‘857, col. 3, ll. 5-19; Engelsberg ‘968, col. 4, ll. 25-50; Elliott, pp. 3-7; and Livshits, pp. 1-6).
9. Neither Nachshon, the Engelsberg article, Engelsberg ‘472, Engelsberg ‘857, Engelsberg ‘968, Elliott, nor Livshits disclose the claimed solvent rinse prior to the laser treatment.

PRINCIPLES OF LAW

The Examiner bears the initial burden of establishing a *prima facie* case of unpatentability. *In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992).

“[A] patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art.” *KSR Int’l Co. v. Teleflex, Inc.*, 550 U.S. 398, 418 (2007). “[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006).

ANALYSIS AND CONCLUSION

Appellants argue that the Examiner relied upon impermissible hindsight in combining the cited prior art references. (App. Br. 11). In addition, Appellants argue that

there is not the slightest disclosure or suggestion that such laser cleaning is used in conjunction with a sulfur trioxide [and solvent rinse] treatment. Indeed, these references all suggest complete removal of the resist by the disclosed procedures. There would be no incentive for one skilled in the art to include such a procedure as part of Appellants’ claimed process

(App. Br. 7). Appellants also argue that the Examiner cites Nachshon, the Engelsberg article, Engelsberg ‘472, Engelsberg ‘857, Engelsberg ‘968, Livshits, and Elliott “for their teaching of ‘precise cleaning and photoresists removal by lasers’ . . . [however] Appellants can find no mention of a solvent rinse preceding the laser treatment [which corresponds to the claimed chemical or physical post-rinse treatment].” (App. Br. 11 and 12). We agree.

Gupta teaches completely stripping a polymerized photoresist via, *inter alia*, exposing the polymerized photoresist to gaseous sulfur trioxide

and rinsing in a solution (solvent rinse) to remove any reaction products. (FF 5).

The Examiner relies on Nachshon, the Engelsberg article, Engelsberg '472, Engelsberg '857, Engelsberg '968, Livshits, and/or Elliott to teach the use of a laser as corresponding to the claimed chemical or physical post-rinse treatment. (Ans. 4, 5, and 7-9). In this regard, Nachshon teaches the complete stripping of a photoresist layer using, *inter alia*, a reactive atmosphere before irradiation via a pulsed laser (chemical or physical post-rinse treatment). (FF 7). Similarly, the Engelsberg article, Engelsberg '472, Engelsberg '857, Engelsberg '968, Elliott, and Livshits, individually teach the removal of material or contaminants using, *inter alia*, a laser. (FF 8).

The Examiner, however, has not provided an adequate reason *why* one of ordinary skill would have employed a laser subsequent to Gupta's rinse step (solvent rinse) in view of the fact that Gupta teaches that its photoresist stripping process *completely* removes a photoresist.

In this regard, although the Examiner states (Ans. 5 and 9) that "the other cited documents teach that chemical and wet treatments may be insufficient to remove all contaminants and/or all photoresists," the Examiner fails to direct us to any credible evidence or provide any persuasive explanation to show that contaminants remain on a substrate after Gupta's *solvent* rinse step thereby inviting the post-rinse treatment recited in the claims on appeal.

Thus, it follows that the Examiner's § 103 rejection over the applied prior art references does not satisfy the Examiner's initial burden of presenting a *prima facie* case of obviousness so as to shift the burden to Appellants to establish non-obviousness of the claimed invention.

Accordingly, we do not sustain the Examiner's decision to reject claims 1-4, 6, 7, 11-14, 18-25 and 29-30 under § 103(a) over the applied prior art references.

ORDER

The Examiner's decision is reversed.

REVERSED

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